

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : SEIKO PRECISION KK

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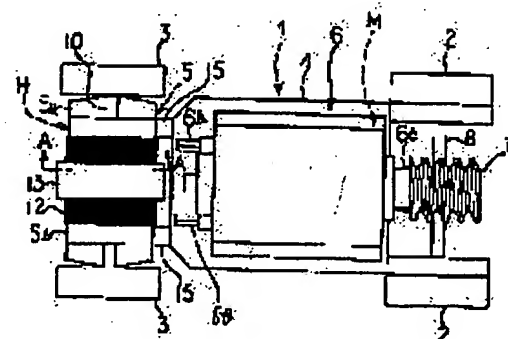
(72)Inventor : ITO AKIHIRO  
YANAGISAWA SHIGERU

## (54) SMALL MODEL AUTOMOBILE

### (57)Abstract:

PROBLEM TO BE SOLVED: To provide a small, inexpensive, remotely-controllable model automobile.

SOLUTION: The driving part M of a small model automobile is designed to be able to drive rear wheels 2 by means of a motor 6 and a worm mechanism which are mounted in a driving-part chassis 4. A steering part H is mounted on a steering-part chassis 5 and designed to be capable of controlling the direction of front wheels 3 by rolling a front-wheel axle 10 by means of a rolling motor comprising a rotor 11, a coil 12, and a yoke 13. Because the model automobile is structurally simplified as a whole, cost reduction and miniaturization are made possible, and the model automobile is easy to purchase and suited as a toy for use indoors.



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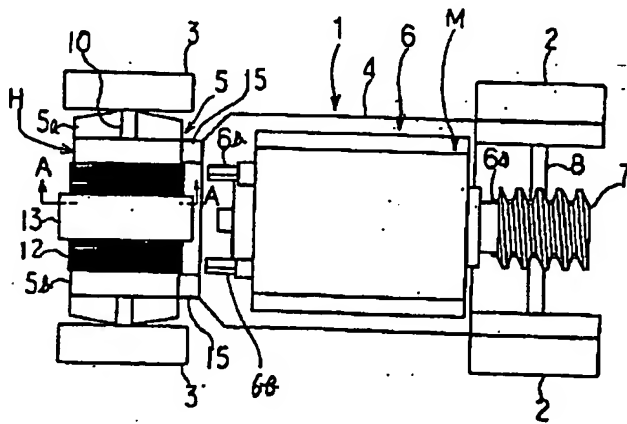
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CLAIMS

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[Claim(s)]

[Claim 1] The small model automobile characterized by having enabled change of the sense of the above-mentioned front-wheel axle by having equipped with the swing motor characterized by providing the following, and controlling the energization to the above-mentioned coil. The mechanical component which makes a rear wheel drive by the motor carried on the chassis. Rota established in the above-mentioned front-wheel axle which is equipped with the steering section steered by making a front-wheel axle rock, and was prepared in the above-mentioned steering section at the rockable at the rockable united with this. The coil which drives the Rota concerned.

[Claim 2] It is the small model automobile characterized by for the above-mentioned front wheel fitting in loosely to the above-mentioned axle in a claim 1, and having prepared play in shaft orientations.

[Claim 3] It is the small model automobile characterized by for the mechanical-component chassis in which the above-mentioned chassis carries the above-mentioned mechanical component in claims 1 or 2, and the steering section chassis in which the above-mentioned steering section is carried constituting, and having connected the above-mentioned mechanical-component chassis and the above-mentioned steering section chassis through flat spring.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention relates to the small model automobile it can run in the arbitrary direction by remote operation.

[0002]

[Description of the Prior Art] Vehicles, such as a passenger car, and a bus or a tank, are imitated more from ancient times, and it is loved by the laity layer with the model vehicle equipped with the run function from a small child to [layer] an adult. Development of the latest electronic technology has also reached the world of such a model vehicle, and it is well known that the so-called remote control car etc. has spread.

[0003] What generally combined the spring and the plunger, using a servo motor and a stepping motor as a steering gear style of a model automobile is known.

[0004]

[Problem(s) to be Solved by the Invention] However, when the miniaturization of the remote-operation formula model automobile currently requested also from the industry of a model automobile was advanced, the actuator of a drive and a steering gear style became an obstacle, and at steering gear guard, in order to use the mechanism which combined the spring and the plunger, using a servo motor and a stepping motor, a miniaturization is difficult and became complicated and expensive including the mechanism, the control circuit, etc.

[0005]

[Means for Solving the Problem] In order to solve the above-mentioned problem, the small model automobile of this invention has simplified the mechanism of the steering section by adopting the mechanism in which a front-wheel axle is made to rock with electromagnetic force. The simplification of such a mechanism enables the miniaturization of a model automobile, and has a special feature as a small model automobile of a remote-operation formula. This steering section is steered by the swing motor and the swing motor is constituted by Rota established in the above-mentioned front-wheel axle prepared in the rockable at the rockable united with this, and the coil which drives this Rota. It is made for steering to make the sense of a front-wheel axle have changed by making a swing motor rock towards desired by controlling the energization to a coil by three patterns of OFF, the right direction, and an opposite direction.

[0006] The front wheel has aimed at fall prevention in the case of directional change by fitting in loosely to an axle and preparing play in shaft orientations. Moreover, with the structure which does not have a suspension mechanism in each wheel, when a mechanical component and the steering section are connected with one with a rigid high chassis, although all positive groundings are impossible four order rings from the irregularity of a run road surface, the unevenness of a load to each wheel at the time of revolution, etc. Fall prevention can be aimed at, while a grounding state becomes good by the simple mechanism when a run road surface is not flat and turnability and the transferability of driving force improve, when a mechanical component and the steering section are connected by flexible flat spring, and the body gets twisted moderately.

[0007]

[Embodiments of the Invention] The small model automobile of this invention is equipped with the mechanical component which makes a rear wheel drive by the motor carried on the chassis, and the steering section steered by making a front-wheel axle rock. in this steering section The front-wheel axle prepared in the rockable is equipped with the swing motor which consists of Rota established in the rockable united with this, and a coil which drives this Rota, and change of the sense of a front-wheel axle is enabled by controlling the energization to a coil.

[0008] As for a front wheel, it is desirable to fit in loosely to an axle and to have prepared play in shaft orientations. The mechanical-component chassis in which a mechanical component is carried, and the steering section chassis in

which the steering section is carried constitute the chassis, and the mechanical-component chassis and the steering section chassis may be connected through flat spring.

[0009]

[Example] Drawing 1 -3 show the composition of the whole small model automobile concerning this invention, and they have attached it in the chassis 1 possible [ rotation of rear wheels 2 and 2 and front wheels 3 and 3 ]. The chassis 1 is equipped with the steering section H steered by being located in a mechanical-component [ which it is located / mechanical component / in a rear wheel side and makes a rear wheel 2 drive by the below-mentioned motor 6 for a drive ] M, and front-wheel side, and making the below-mentioned front-wheel axle 10 rock. The mechanical-component chassis 4 in which a mechanical component M is carried, and the steering section chassis 5 in which the steering section H is carried constitute the chassis 1, and the mechanical-component chassis 4 and the steering section chassis 5 are divided.

[0010] On the mechanical-component chassis 4, the motor 6 for a drive is carried so that it may be in agreement with the longitudinal direction of a chassis in output-shaft 6a. Worm 7 is fixed to the point of output-shaft 6a of a motor 6. Moreover, the worm gear 9 is attached in the center section of the rear wheel axle 8 which supports rear wheels 2 and 2, and it has geared with the sense which intersects perpendicularly with a worm 7. It has fixed to the ends of the rear wheel axle 8, and rear wheels 2 and 2 are made possible [ the rotation to one ] for a worm gear 9, the rear wheel axle 8, and rear wheels 2 and 2. Therefore, rotation of a drive motor 6 can be transmitted to rear wheels 2 and 2 through the worm wheel mechanism of a bird clapper from a worm 7, a worm wheel 9, and the rear wheel axle 8. The terminal sections 6b and 6b are formed in the front end section (drawing left-hand side) of a motor 6, and supply of the power from the cell which is not illustrated to a drive motor 6 is enabled.

[0011] The steering section chassis 5 is supported by the front-wheel axle 10, and lower chassis 5a formed in the shape of [ which opened the upper part wide ] a KO character, and upper chassis 5b provided so that the release section of this lower chassis may be covered constitute it.

[0012] As shown in drawing 4 and 6, Rota 11 of the shape of a pillar which constitutes swing-motor Y which makes the front-wheel axle 10 rock is built in the interior of lower chassis 5a. Rota 11 is established in the front-wheel axle 10 prepared in the rockable at the rockable united with this. That is, Rota 11 has fitted in loosely the surroundings of Rota heart 11a which the upper limit was supported by upper chassis 5b, and was perpendicularly prepared in it possible [ rotation ] along with the inner circumference section of lower chassis 5a.

[0013] The coil 12 which constitutes swing-motor Y is wound around the periphery section of the portion which serves as tubed by lower chassis 5a and upper chassis 5b. The winding range of a coil 12 is crossed to mist or the latus range from the projection width of face of Rota 11, and enables it to fully have done the electromagnetic force to Rota. Swing-motor Y consists of Rota 11 and a coil 12, and change of the sense of the front-wheel axle 10 of it is enabled by controlling the energization to this coil. The yoke 13 is formed in the range covering the upper surface and the both-sides side of a center section of a coil 12. As a yoke 13 is shown in . drawing 5 which is in the state where the saddle was put on the range ranging from the center section to predetermined width of face of Rota 11, front wheels 3 and 3 consist of wheel 3a and tire 3b which fixed on the periphery, and it has fitted loosely into the ends of the front-wheel axle 10, respectively. Each front wheels 3 and 3 are supported by the bush 14 which fixed to the point of each front-wheel axle 10 at defluxion impotentia.

[0014] Both the points that have set to major-diameter section 10a the range in which the front-wheel axle 10 goes into the both-sides circles of lower chassis 5a, and project from the both sides of lower chassis 5a are arranged so that the level difference of an axle 10 may become outside to the side of the steering section chassis 5, they prepare a level difference, and have made it the minor diameter section. That is, a front wheel 3 fits in loosely to an axle 10, and it plays to shaft orientations (gap), and G is prepared.

[0015] The prevention of front-wheel wheel 3a is enabled [ coming together inside more than this with the level difference of major-diameter section 10a and minor diameter section 10b, and ]. Wheel 3a is made impossible [ defluxion ] from the front-wheel axle by fixing a bush 14 at the nose of cam of minor diameter section 10b of a front-wheel axle. The inside section of a front wheel 3 is made into the flat side, and tire 3b which consists of a ring made of rubber is firmly inserted in the periphery section.

[0016] Between crevice 3c of the core of wheel 3a, and the appearances of a bush 14, and between the base of crevice 3c, and the medial surfaces of a bush 14, Between the bore of wheel 3a, and minor diameter section 10b of a front-wheel axle, further between the inside section of wheel 3a, and major-diameter section 10a Since it plays, respectively (gap) and G is prepared, while a right-and-left ring can rotate independently to an axle 10, thereby, a front wheel 3 absorbs the inner-ring-of-spiral-wound-gasket difference at the time of revolution, and raises turnability. By arranging so that the level difference of an axle 10 may become outside to the side of the steering section chassis 5, interference

of the wheel 3a side and the steering section chassis 5 side can be prevented. It is possible to attach the camber angle prepared in order to raise the Toin angle, road-hugging, and turnability which are set up in order to maintain rectilinear-propagation nature with easy structure and to raise turnability, since an axle 10 does not rotate in connection with wheel 3a at the time of a run.

[0017] A central portion juts out the both-sides section of lower chassis 5a of a steering section chassis to the method of outside, and it is formed in the shape of [ which has the inclination to which the portion of order retreats / loose ] a mountain. The both-sides section of the shape of these mountain enables the suppression of rocking beyond this, when the front-wheel axle 10 rocks, and the inside section of wheel 3a contacts one of inclined planes. Therefore, regulation of the minimum radius of gyration of this small model automobile is enabled with the angle of this inclined plane (refer to drawing 7 ).

[0018] Drawing 7 shows operation of the steering section H. Rota 11 of the front-wheel axle 10 and one has made the south pole the front-wheel axle of the periphery section, and the position where a position is made into N pole and while it is right-angled counters with this. Since the detent in the state by which the magnetic suction force was stabilized with the structure where the big force is acquired by constructing a magnetic circuit, and a magnetic pole is simply attracted by soft-magnetism material where it does not energize (rotation stop) is not obtained, with this composition, by making N-S each magnetic pole approach through a yoke 13, it constitutes a magnetic circuit, raises static stability nature, and has raised rectilinear-propagation nature. Thus, in order that a suction force may commit Rota 11 so that each magnetic pole may carry out a closest approach to a yoke 13 when the coil 12 is not energized, the front-wheel axle 10 holds the state of making it going in the direction which makes each front wheels 3 and 3 going straight on (refer to drawing 5 ).

[0019] On the other hand, if a coil 12 is energized, the magnetic field of the direction which changes with directions of energization will arise, and an N pole and another side side will serve as [ one coil 12 side ] the south pole. For this reason, N pole in Rota 11 is attracted by the south pole of a coil 12, the south pole of Rota 11 is attracted on the N pole of a coil 12, and the force in which it rotates Rota 11 the very thing works.

[0020] In this way, as it rocks and is shown in drawing 7 (a), front wheels 3 and 3 will be made into facing the left, or if it energizes in a coil 12, when swing-motor Y rocks, the front-wheel axle 10 will be carried out rightward, as shown in drawing 7 (b). However, in any case, the amount of rocking, i.e., a rocking angle, is decided by the inclined plane of the both-sides section of lower chassis 5a. In drawing 7 , this angle is regulated within the limits of 10 degrees.

[0021] Next, connection of a chassis is again explained using drawing 1 -3. The mechanical-component chassis 4 and the steering section chassis 5 are connected through one pair of flat spring 15 and 15. Flat spring 15 is joined to the base of each chassis 4 and 5 through adhesives etc., as it consists of what cut the strip which has the elasticity of predetermined width of face to predetermined length and a plate surface turns into a vertical side from both ends in the range of fixed length (refer to drawing 3 ). Since the span of a spring becomes large so that the interval of the mechanical-component chassis 4 and the steering section chassis 5 is large, the amount of displacement in the vertical motion of the steering section chassis 5 to the mechanical-component chassis 4 becomes large. Moreover, since this vertical motion is influenced also by the second moment of area of flat spring 15, the rigidity between both chassis is defined from these relations. In this invention, by making flat spring intervene, rigidity between both the chassis 4 and 5 is made small, and when the body gets twisted moderately, while a grounding state becomes good by the simple mechanism when a run road surface is not flat and turnability and the transferability of driving force improve, fall prevention under run can be aimed at. Also in this example, although it has the dc-battery, and wiring and a remote-operation means as a small model automobile, illustration is omitted here.

[0022] [Operating instruction] As mentioned already, when it is in the state where it does not energize in the coil 12, the front-wheel axle 10 is set as the state which can be gone straight on. That in which the run switch which takes out the electrical signal which makes the remote control control panel (remote control, illustration abbreviation) which has a cable put into operation and suspend the motor 6 for a drive as this example, the right-hand drive switch (R) which can transmit the electrical signal which makes swing-motor Y rock in the direction of right-handed rotation, and the direction switch equipped with the left-hand drive switch (L) to which the opposite movement is carried out have been formed has been adopted.

[0023] If the depression only of the run switch is carried out, the motor 6 for a drive will start, and this model automobile goes straight on, and if a switch is turned OFF, it will suspend a run by motor halt. Moreover, a direction switch regulates the direction where the current of a swing motor flows, only while pushing each handle switch, and it maintains the state where the sense was changed for the front-wheel axle 10 in the fixed angle (10 degrees) range the right or leftward. For this reason, when either of this switch is turned ON during a run of a model automobile, a run

will be continued with a fixed radius of gyration. If these direction switches are turned OFF, it will change to rectilinear propagation with the sense at that time. Therefore, by operating these run switches and direction switches, a model automobile can be operated so that it may arrive at a desired position easily.

[0024] In addition, about a remote control control panel, it can consider as the thing in which various kinds of remote operation is possible according to the performance of a model automobile. In a high-class thing, it is also possible to replace with this remote control control panel, and for it to consider as a radio control control panel (radio control), and to adjust the speed of a model automobile, or for it to be made to back, and to be [ it is sufficient and ] made to carry out. Moreover, it cannot be overemphasized that the remote control which has an infrared signal may be used.

[0025] Since the model automobile concerning this invention is considered as simple composition, it has realized miniaturization and low-pricing. In order to enable it to have played also indoors furthermore, it will become suitable as a toy for small children. Incidentally the size of the model automobile in this example is made into the thing with an overall length of about 3cm.

[0026]

[Effect of the Invention] According to this invention, since it has simple composition, offer of a small and cheap small model automobile is attained. This can expect easily available and finding it useful as a small model automobile with which it can play also indoors.

[0027] Moreover, it is possible to attach the camber angle prepared in order to raise the Toin angle, road-hugging, and turnability which are set up in order to maintain rectilinear-propagation nature with easy structure and to raise turnability, since an axle does not rotate in connection with a wheel at the time of a run while a front wheel can absorb the inner-ring-of-spiral-wound-gasket difference at the time of revolution and can raise turnability, if it fits in loosely to an axle and play is prepared in shaft orientations.

[0028] In addition, while a grounding state will become good by the simple mechanism when a run road surface is not flat and turnability and the transferability of driving force will improve when the body gets twisted moderately if a mechanical-component chassis and a steering section chassis are connected by flat spring, fall prevention under run can be aimed at.

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TECHNICAL FIELD

[Field of the Invention] this invention relates to the small model automobile it can run in the arbitrary direction by remote operation.

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PRIOR ART

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[Description of the Prior Art] Vehicles, such as a passenger car, and a bus or a tank, are imitated more from ancient times, and it is loved by the large layer with the model vehicle equipped with the run function from a small child to [ layer ] an adult. Development of the latest electronic technology has also reached the world of such a model vehicle, and it is well known that the so-called remote control car etc. has spread.

[0003] What generally combined the spring and the plunger, using a servo motor and a stepping motor as a steering gear style of a model automobile is known.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention] According to this invention, since it has simple composition, offer of a small and cheap small model automobile is attained. This can expect easily available and finding it useful as a small model automobile with which it can play also indoors.

[0027] Moreover, a front wheel is while being able to absorb the inner-ring-of-spiral-wound-gasket difference at the time of revolution and being able to raise turnability, if it fits in loosely to an axle and play is prepared in shaft orientations. It is possible to attach the camber angle prepared in order to raise the Toin angle, road-hugging, and turnability which are set up in order to maintain rectilinear-propagation nature with easy structure and to raise turnability, since an axle does not rotate in connection with a wheel at the time of a run.

[0028] In addition, while a grounding state will become good by the simple mechanism when a run road surface is not flat and turnability and the transferability of driving force will improve when the body gets twisted moderately if a mechanical-component chassis and a steering section chassis are connected by flat spring, fall prevention under run can be aimed at.

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] However, when the miniaturization of the remote-operation formula model automobile currently requested also from the industry of a model automobile was advanced, the actuator of a drive and a steering gear style became an obstacle, and at steering gear guard, in order to use the mechanism which combined the spring and the plunger, using a servo motor and a stepping motor, a miniaturization is difficult and became complicated and expensive including the mechanism, the control circuit, etc.

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned problem, the small model automobile of this invention has simplified the mechanism of the steering section by adopting the mechanism in which a front-wheel axle is made to rock with electromagnetic force. The simplification of such a mechanism enables the miniaturization of a model automobile, and has a special feature as a small model automobile of a remote-operation formula. This steering section is steered by the swing motor and the swing motor is constituted by Rota established in the above-mentioned front-wheel axle prepared in the rockable at the rockable united with this, and the coil which drives this Rota. It is made for steering to make the sense of a front-wheel axle have changed by making a swing motor rock towards desired by controlling the energization to a coil by three patterns of OFF, the right direction, and an opposite direction.

[0006] The front wheel has aimed at fall prevention in the case of directional change by fitting in loosely to an axle and preparing play in shaft orientations. Moreover, with the structure which does not have a suspension mechanism in each wheel, when a mechanical component and the steering section are connected with one with a rigid high chassis, although all positive groundings are impossible four order rings from the irregularity of a run road surface, the unevenness of a load to each wheel at the time of revolution, etc. Fall prevention can be aimed at, while a grounding state becomes good by the simple mechanism when a run road surface is not flat and turnability and the transferability of driving force improve, when a mechanical component and the steering section are connected by flexible flat spring, and the body gets twisted moderately.

[0007]

[Embodiments of the Invention] The small model automobile of this invention is equipped with the mechanical component which makes a rear wheel drive by the motor carried on the chassis, and the steering section steered by making a front-wheel axle rock. In this steering section The front-wheel axle prepared in the rockable is equipped with the swing motor which consists of Rota established in the rockable united with this, and a coil which drives this Rota, and change of the sense of a front-wheel axle is enabled by controlling the energization to a coil.

[0008] As for a front wheel, it is desirable to fit in loosely to an axle and to have prepared play in shaft orientations. The mechanical-component chassis in which a mechanical component is carried, and the steering section chassis in which the steering section is carried constitute the chassis, and the mechanical-component chassis and the steering section chassis may be connected through flat spring.

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EXAMPLE

[Example] Drawing 1 -3 show the composition of the whole small model automobile concerning this invention, and they have attached it in the chassis 1 possible [ rotation of rear wheels 2 and 2 and front wheels 3 and 3 ]. The chassis 1 is equipped with the steering section H steered by being located in a mechanical-component [ which it is located / mechanical component / in a rear wheel side and makes a rear wheel 2 drive by the below-mentioned motor 6 for a drive ] M, and front-wheel side, and making the below-mentioned front-wheel axle 10 rock. The mechanical-component chassis 4 in which a mechanical component M is carried, and the steering section chassis 5 in which the steering section H is carried constitute the chassis 1, and the mechanical-component chassis 4 and the steering section chassis 5 are divided.

[0010] On the mechanical-component chassis 4, the motor 6 for a drive is carried so that it may be in agreement with the longitudinal direction of a chassis in output-shaft 6a. Worm 7 is fixed to the point of output-shaft 6a of a motor 6. Moreover, the worm gear 9 is attached in the center section of the rear wheel axle 8 which supports rear wheels 2 and 2, and it has geared with the sense which intersects perpendicularly with a worm 7. It has fixed to the ends of the rear wheel axle 8, and rear wheels 2 and 2 are made possible [ the rotation to one ] for a worm gear 9, the rear wheel axle 8, and rear wheels 2 and 2. Therefore, rotation of a drive motor 6 can be transmitted to rear wheels 2 and 2 through the worm wheel mechanism of a bird clapper from a worm 7, a worm wheel 9, and the rear wheel axle 8. The terminal sections 6b and 6b are formed in the front end section (drawing left-hand side) of a motor 6, and supply of the power from the cell which is not illustrated to a drive motor 6 is enabled.

[0011] The steering section chassis 5 is supported by the front-wheel axle 10, and lower chassis 5a formed in the shape of [ which opened the upper part wide ] a KO character, and upper chassis 5b provided so that the release section of this lower chassis may be covered constitute it.

[0012] As shown in drawing 4 and 6, Rota 11 of the shape of a pillar which constitutes swing-motor Y which makes the front-wheel axle 10 rock is built in the interior of lower chassis 5a. Rota 11 is established in the front-wheel axle 10 prepared in the rockable at the rockable united with this. That is, Rota 11 has fitted in loosely the surroundings of Rota heart 11a which the upper limit was supported by upper chassis 5b, and was perpendicularly prepared in it possible [ rotation ] along with the inner circumference section of lower chassis 5a.

[0013] The coil 12 which constitutes swing-motor Y is wound around the periphery section of the portion which serves as tubed by lower chassis 5a and upper chassis 5b. The winding range of a coil 12 is crossed to mist or the latus range from the projection width of face of Rota 11, and enables it to fully have done the electromagnetic force to Rota. Swing-motor Y consists of Rota 11 and a coil 12, and change of the sense of the front-wheel axle 10 of it is enabled by controlling the energization to this coil. The yoke 13 is formed in the range covering the upper surface and the both-sides side of a center section of a coil 12. As a yoke 13 is shown in drawing 5 which is in the state where the saddle was put on the range ranging from the center section to predetermined width of face of Rota 11, front wheels 3 and 3 consist of wheel 3a and tire 3b which fixed on the periphery, and it has fitted loosely into the ends of the front-wheel axle 10, respectively. Each front wheels 3 and 3 are supported by the bush 14 which fixed to the point of each front-wheel axle 10 at defluxion impotentia.

[0014] Both the points that have set to major-diameter section 10a the range in which the front-wheel axle 10 goes into the both-sides circles of lower chassis 5a, and project from the both sides of lower chassis 5a are arranged so that the level difference of an axle 10 may become outside to the side of the steering section chassis 5, they prepare a level difference, and have made it the minor diameter section. That is, a front wheel 3 fits in loosely to an axle 10, and it plays to shaft orientations (gap), and G is prepared.

[0015] The prevention of front-wheel wheel 3a is enabled [ coming together inside more than this with the level difference of major-diameter section 10a and minor diameter section 10b, and ]. Wheel 3a is made impossible

[ defluxion ] from the front-wheel axle by fixing a bush 14 at the nose of cam of minor diameter section 10b of a front-wheel axle. The inside section of a front wheel 3 is made into the flat side, and tire 3b which consists of a ring made of rubber is firmly inserted in the periphery section.

[0016] Between crevice 3c of the core of wheel 3a, and the appearances of a bush 14, and between the base of crevice 3c, and the medial surfaces of a bush 14, Between the bore of wheel 3a, and minor diameter section 10b of a front-wheel axle, further between the inside section of wheel 3a, and major-diameter section 10a Since it plays, respectively (gap) and G is prepared, while a right-and-left ring can rotate independently to an axle 10, thereby, a front wheel 3 absorbs the inner-ring-of-spiral-wound-gasket difference at the time of revolution, and raises turnability. By arranging so that the level difference of an axle 10 may become outside to the side of the steering section chassis 5, interference of the wheel 3a side and the steering section chassis 5 side can be prevented. It is possible to attach the camber angle prepared in order to raise the Toin angle, road-hugging, and turnability which are set up in order to maintain rectilinear-propagation nature with easy structure and to raise turnability, since an axle 10 does not rotate in connection with wheel 3a at the time of a run.

[0017] A central portion juts out the both-sides section of lower chassis 5a of a steering section chassis to the method of outside, and it is formed in the shape of [ which has the inclination to which the portion of order retreats / loose ] a mountain. The both-sides section of the shape of these mountain enables the suppression of rocking beyond this, when the front-wheel axle 10 rocks, and the inside section of wheel 3a contacts one of inclined planes. Therefore, regulation of the minimum radius of gyration of this small model automobile is enabled with the angle of this inclined plane (refer to drawing 7 ).

[0018] Drawing 7 shows operation of the steering section H. Rota 11 of the front-wheel axle 10 and one has made the south pole the front-wheel axle of the periphery section, and the position where a position is made into N pole and while it is right-angled counters with this. Since the detent in the state by which the magnetic suction force was stabilized with the structure where the big force is acquired by constructing a magnetic circuit, and a magnetic pole is simply attracted by soft-magnetism material where it does not energize (rotation stop) is not obtained, with this composition, by making N-S each magnetic pole approach through a yoke 13, it constitutes a magnetic circuit, raises static stability nature, and has raised rectilinear-propagation nature. Thus, in order that a suction force may commit Rota 11 so that each magnetic pole may carry out a closest approach to a yoke 13 when the coil 12 is not energized, the front-wheel axle 10 holds the state of making it going in the direction which makes each front wheels 3 and 3 going straight on (refer to drawing 5 ).

[0019] On the other hand, if a coil 12 is energized, the magnetic field of the direction which changes with directions of energization will arise, and an N pole and another side side will serve as [ one coil 12 side ] the south pole. For this reason, N pole in Rota 11 is attracted by the south pole of a coil 12, the south pole of Rota 11 is attracted on the N pole of a coil 12, and the force in which it rotates Rota 11 the very thing works.

[0020] In this way, as it rocks and is shown in drawing 7 (a), front wheels 3 and 3 will be made into facing the left, or if it energizes in a coil 12, when swing-motor Y rocks, the front-wheel axle 10 will be carried out rightward, as shown in drawing 7 (b). However, in any case, the amount of rocking, i.e., a rocking angle, is decided by the inclined plane of the both-sides section of lower chassis 5a. In drawing 7 , this angle is regulated within the limits of 10 degrees.

[0021] Next, connection of a chassis is again explained using drawing 1 -3. The mechanical-component chassis 4 and the steering section chassis 5 are connected through one pair of flat spring 15 and 15. Flat spring 15 is joined to the base of each chassis 4 and 5 through adhesives etc., as it consists of what cut the strip which has the elasticity of predetermined width of face to predetermined length and a plate surface turns into a vertical side from both ends in the range of fixed length (refer to drawing 3 ). Since the span of a spring becomes large so that the interval of the mechanical-component chassis 4 and the steering section chassis 5 is large, the amount of displacement in the vertical motion of the steering section chassis 5 to the mechanical-component chassis 4 becomes large. Moreover, since this vertical motion is influenced also by the second moment of area of flat spring 15, the rigidity between both chassis is defined from these relations. In this invention, by making flat spring intervene, rigidity between both the chassis 4 and 5 is made small, and when the body gets twisted moderately, while a grounding state becomes good by the simple mechanism when a run road surface is not flat and turnability and the transferability of driving force improve, fall prevention under run can be aimed at. Also in this example, although it has the dc-battery, and wiring and a remote-operation means as a small model automobile, illustration is omitted here.

[0022]

[Operating instruction] As mentioned already, when it is in the state where it does not energize in the coil 12, the front-wheel axle 10 is set as the state which can be gone straight on. That in which the run switch which takes out the electrical signal which makes the remote control control panel (remote control, illustration abbreviation) which has a

cable put into operation and suspend the motor 6 for a drive as this example, the right-hand drive switch (R) which can transmit the electrical signal which makes swing-motor Y rock in the direction of right-handed rotation, and the direction switch equipped with the left-hand drive switch (L) to which the opposite movement is carried out have been formed has been adopted.

[0023] If the depression only of the run switch is carried out, the motor 6 for a drive will start, and this model automobile goes straight on, and if a switch is turned OFF, it will suspend a run by motor halt. Moreover, a direction switch regulates the direction where the current of a swing motor flows, only while pushing each handle switch, and it maintains the state where the sense was changed for the front-wheel axle 10 in the fixed angle (10 degrees) range the right or leftward. For this reason, when either of this switch is turned ON during a run of a model automobile, a run will be continued with a fixed radius of gyration. If these direction switches are turned OFF, it will change to rectilinear propagation with the sense at that time. Therefore, by operating these run switches and direction switches, a model automobile can be operated so that it may arrive at a desired position easily.

[0024] In addition, about a remote control control panel, it can consider as the thing in which various kinds of remote operation is possible according to the performance of a model automobile. In a high-class thing, it is also possible to replace with this remote control control panel, and for it to consider as a radio control control panel (radio control), and to adjust the speed of a model automobile, or for it to be made to back, and to be [ it is sufficient and ] made to carry out. Moreover, it cannot be overemphasized that the remote control which has an infrared signal may be used.

[0025] Since the model automobile concerning this invention is considered as simple composition, it has realized miniaturization and low-pricing. In order to enable it to have played also indoors furthermore, it will become suitable as a toy for small children. Incidentally the size of the model automobile in this example is made into the thing with an overall length of about 3cm.

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[Translation done.]



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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the plan showing the composition of this invention.

[Drawing 2] It is the side elevation of drawing 1 .

[Drawing 3] It is a \*\*\*\* bottom plan view.

[Drawing 4] It is the A-A line cross section of drawing 1 .

[Drawing 5] It is the expanded sectional view showing the relation between a mechanical-component chassis, a front-wheel axle, and a front wheel.

[Drawing 6] It is explanatory drawing showing operation of the steering section, and is the cross section showing a state when not energized by the coil.

[Drawing 7] It is explanatory drawing showing operation of the steering section, and, as for (a), a front wheel shows the state where it has become rightward, as for the state where the front wheel has become leftward, and (b).

[Description of Notations]

M Mechanical component

G Play

H Steering section

Y Swing motor

1 Chassis

2 Rear Wheel

3 Front Wheel

4 Mechanical-Component Chassis

5 Steering Section Chassis

6 Motor

10 Front-Wheel Axle

11 Rota

12 Coil

15 Flat Spring

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[Translation done.]

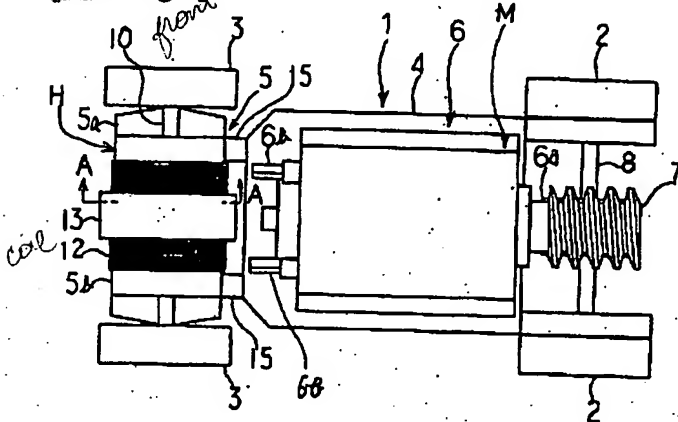
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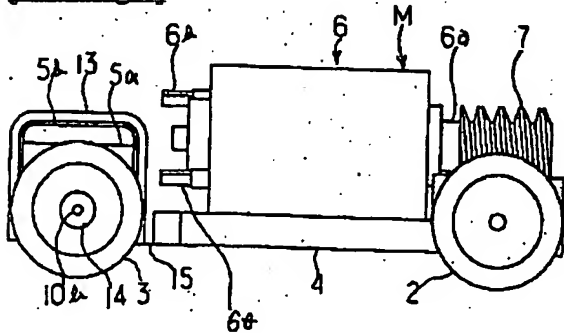
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## DRAWINGS

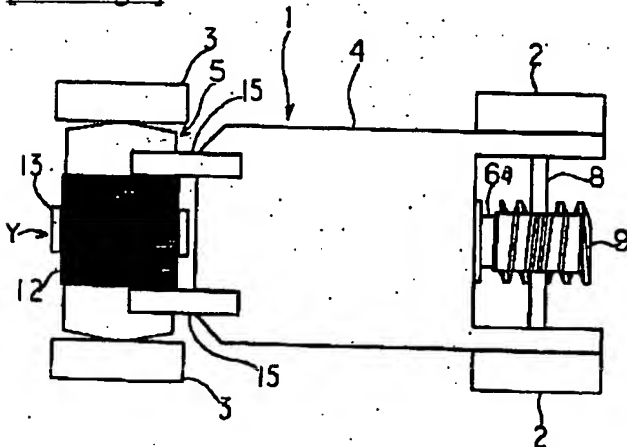
[Drawing 1]



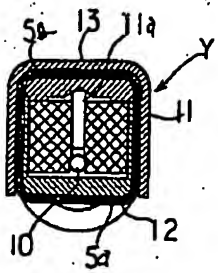
[Drawing 2]



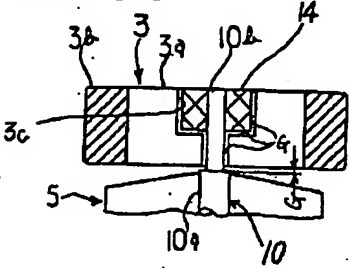
[Drawing 3]



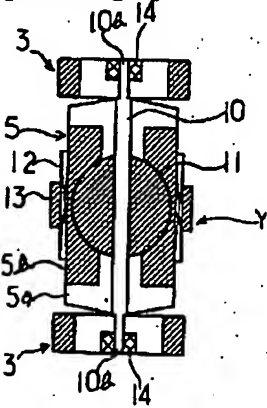
[Drawing 4]



[Drawing 5]



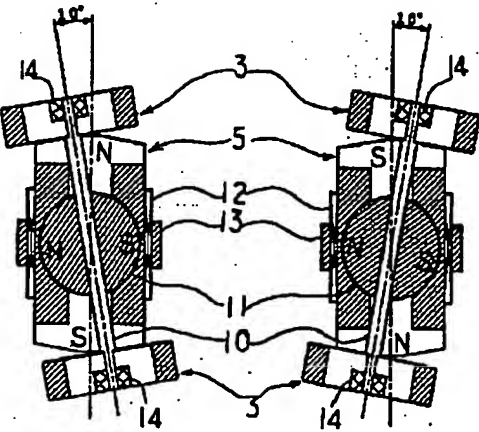
[Drawing 6]



[Drawing 7]

(a)

(b)



[Translation done.]